

**WHAT IS CLAIMED IS:**

1. A system for forming absorbent articles comprising:
  - a first supply station for providing a cover material into a processing line;
  - 5 a second supply station for providing a liner material into the processing line;
  - an absorbent material supply source for providing an absorbent material into the processing line;
  - the processing line being configured to place the absorbent material in between the cover material and the liner material for forming absorbent articles;
  - 10 and
  - wherein at least one of the cover material, liner material, or absorbent material is provided from an unwinding apparatus comprising:
    - (a) an unwind device for unwinding a roll of material;
    - 15 (b) a festoon positioned downstream of the unwind device, the festoon comprising a first set of guide rolls spaced from a second set of guide rolls, the first set of guide rolls being in operative association with a carriage, the carriage being movable towards the second set of guide rolls, the festoon accumulating a determined length of the material sufficient to sustain temporary stoppages by the unwind device during an unwind process; and
    - 20 (c) a plurality of drive devices coupled to selected guide rolls contained in the festoon, each of the drive devices being configured to decelerate or accelerate a corresponding guide roll when the unwind device decreases or increases the rate at which the roll of material is unwound
    - 25 respectively and wherein each drive device operates independently of the remaining drive devices such that each corresponding guide roll is decelerated or accelerated at a different rate.
2. A system as defined in claim 1, wherein each of the drive devices are further configured only to decelerate the corresponding guide roll when the unwind device decreases the rate at which the roll of material is unwound.
- 30 3. A system as defined in claim 1, wherein the festoon includes from about four (4) to about ten (10) guide rolls.

4. A system as defined in claim 1, wherein the system further comprises a tension control device for controlling the tension of the material after the material is unwound.

5. A system as defined in claim 4, wherein the tension control device comprises a dancer roll spaced from a pair of stationary rolls, the dancer roll applying a determined amount of force against the material, the dancer roll being movable towards and away from the stationary rolls.

6. A system as defined in claim 1, wherein the unwind device includes a first position for unwinding a first roll of material and a second position for unwinding a second roll of material, the system further including a splicing device for splicing the second roll of material to the first roll of material when desired.

7. A system as defined in claim 2, wherein each drive device comprises a braking device.

8. A system as defined in claim 1, wherein each drive device comprises a servo motor or a stepper motor.

9. A system as defined in claim 1, further comprising a controller in communication with each of the drive devices, the controller controlling the drive devices when the unwind device decreases or increases the rate at which the roll of material is unwound for decelerating or accelerating the corresponding guide rolls respectively.

10. A system as defined in claim 9, wherein each drive device is in association with a speed sensor, the speed sensor sensing the speed of the corresponding guide roll, each speed sensor being in communication with the controller, and wherein the controller, based on information received from the speed sensors, is configured to control each of the drive devices for decelerating or accelerating each guide roll according to a predetermined profile.

11. A system as defined in claim 9, wherein, when the unwind device decreases or increases the rate at which the roll of material is unwound, the controller controls each drive device independently for decelerating or accelerating the guide rolls.

12. A system as defined in claim 11, wherein the deceleration rates of the guide rolls decrease from the upstream guide rolls to the downstream guide

rolls and the acceleration rates of the guide rolls increase from the upstream guide rolls to the downstream guide rolls.

13. A system as defined in claim 9, wherein the controller comprises a microprocessor.

5 14. A system as defined in claim 1, wherein the festoon includes an upstream guide roll, a plurality of midstream guide rolls, and a downstream guide roll, and wherein a drive device is coupled to the upstream guide roll and to each of the midstream guide rolls.

10 15. A system as defined in claim 1, wherein the unwind device comprises a center unwind device.

16. A system as defined in claim 1, wherein the unwinding apparatus is used to unwind the cover material and a second similar unwinding apparatus is used to unwind the liner material.

15 17. A system as defined in claim 1, wherein the system is configured to produce one of diapers, child's training pants, feminine care articles, and incontinence articles.

18. A system for forming absorbent articles comprising:  
a first supply station for providing a cover material into a processing line;

20 a second supply station for providing a liner material into the processing line;

an absorbent material supply source for providing an absorbent material into the processing line;

25 the processing line being configured to place the absorbent material in between the cover material and the liner material for forming absorbent articles; and

wherein at least one of the cover material, liner material, or the absorbent material is unwound from an unwinding apparatus comprising:

(a) an unwind device for unwinding a roll of material;

30 (b) a festoon positioned to receive the material being unwound by the unwind device, the festoon comprising a first set of guide rolls spaced from a second set of guide rolls, the festoon accumulating a determined length of the material and being configured to release the material during an

unwind process, the festoon accumulating the material in an amount sufficient to sustain temporary stoppages by the unwind device during an unwind process;

(c) a plurality of drive devices coupled to selected guide rolls contained in the festoon, each of the drive devices being configured to either accelerate or decelerate a corresponding guide roll when the unwind device respectively increases or decreases the rate at which the roll of material is unwound; and

(d) a controller in communication with each of the drive devices, the controller being configured to control each of the drive devices so as to either accelerate or decelerate the corresponding guide rolls at predetermined respective acceleration or deceleration profiles.

19. A system as defined in Claim 18, wherein the drive devices comprise brake devices that are configured to decelerate the corresponding guide rolls.

20. A system as defined in Claim 18, wherein the drive devices comprise motors that are configured to decelerate and to accelerate the corresponding guide rolls.

21. A system as defined in Claim 18, further comprising a tension control device for controlling the tension of the material after the material is unwound, the tension control device being located downstream from the festoon.

22. A system as defined in Claim 18, wherein the tension control device comprises a dancer roll spaced from a pair of stationary rolls, the dancer roll applies a determined amount of force against the material, the dancer roll being movable towards and away from the stationary rolls.

23. A system as defined in Claim 18, wherein the festoon includes from about four (4) to about ten (10) guide rolls.

24. A system as defined in Claim 18, wherein the unwind device includes a first position for unwinding a first roll of material and a second position for unwinding a second roll of material, the system further including a splicing device for splicing the second roll of material to the first roll of material when desired.

25. A system as defined in Claim 18, wherein each drive device comprises a servo motor or a stepper motor.

26. A system as defined in Claim 18, wherein the controller comprises a microprocessor.

27. A system as defined in Claim 18, wherein the festoon includes an upstream guide roll, a plurality of midstream guide rolls, and a downstream guide roll, and wherein a drive device is coupled to the upstream guide roll and to each of the midstream guide rolls.

5 28. A system as defined in Claim 18, wherein each drive device is in association with a speed sensor, the speed sensor sensing the speed of the corresponding guide roll, the speed sensor being in communication with the controller, the controller, based on information received from the speed sensors, accelerating or decelerating the drive devices according to the predetermined  
10 profile.

29. A system as defined in claim 18, wherein the unwinding apparatus is used to unwind the cover material and a second similar unwinding apparatus is used to unwind the liner material.

30. A system as defined in claim 18, wherein the system is configured to  
15 produce one of diapers, child's training pants, feminine care articles, and incontinence articles.

31. A process for splicing a first roll of material to a second roll of material without interrupting an unwind process during the production of absorbent articles comprising:

20 providing an unwind device, the unwind device being in communication with a festoon, the unwind device for unwinding a roll of material, the festoon including a plurality of rotatable guide rolls through which the material being unwound is threaded, the festoon accumulating a determined length of the material sufficient to sustain temporary stoppages by the unwind device during the  
25 unwind process;

unwinding a first roll of material using the unwind device, the first roll of material being unwound at a determined rate so as to feed the material into a downstream process at a determined speed, the downstream process producing absorbent articles, the material being incorporated into the absorbent articles;

30 decreasing the rate at which the roll of material is unwound at the unwind device causing the accumulated length of the material contained in the festoon to be released in order for the downstream speed of the material to remain substantially unchanged;

splicing a second roll of material to the material being unwound from the first roll during the decrease in rate at which the first roll of material is being unwound;

5 actively decelerating certain of the guide rolls in the festoon when the rate at which the first roll of material is unwound decreases, the guide rolls being decelerated independent of each other, the guide rolls being decelerated at a rate that generally corresponds to the rate at which the material is decelerated through the festoon; and

10 after splicing the second roll of material to the first roll of material, unwinding the second roll of material using the unwind device, the second roll of material being unwound at a rate that is increased to the determined rate at which the first roll of material was unwound in order to continue to produce absorbent articles without interruption.

15 32. A process as defined in claim 31, further comprising the step of actively accelerating certain of the guide rolls in the festoon when the rate at which the second roll of material is unwound increases.

33. A process as defined in claim 31, wherein the festoon includes from about four (4) to about (10) guide rolls.

20 34. A process as defined in claim 31, wherein the guide rolls that are actively decelerated are decelerated according to a predetermined deceleration profile.

25 35. A process as defined in claim 34, wherein the speed of the guide rolls being actively decelerated is monitored and sent to a controller, the controller being configured to decelerate the guide rolls according to the deceleration profile based upon the monitored speed of each guide roll.

36. A process as defined in claim 31, wherein the guide rolls are actively decelerated by a braking device.

37. A process as defined in claim 31, wherein the guide rolls are actively decelerated by a stepper motor or a servo motor.

30 38. A process as defined in claim 31, wherein the festoon includes an upstream guide roll, a plurality of midstream guide rolls, and a downstream guide roll, and wherein the upstream guide roll and the midstream guide rolls are actively decelerated.

39. A process as defined in claim 31, wherein the rate at which the roll of material is unwound is decreased and temporarily stopped.

40. A process as defined in claim 31, wherein the festoon includes a first set of guide rolls spaced from a second set of guide rolls, the first set of guide rolls being in operative association with a carriage, the carriage being movable towards the second set of guide rolls when the rate of material exiting the festoon is greater than the rate of material entering the festoon.

41. A process as defined in claim 31, wherein the roll of material is unwound at a rate of at least 100 feet per minute.

42. A process as defined in claim 31, wherein the festoon accumulates a length of material sufficient to sustain a stoppage of from about one (1) second to about five (5) seconds during the unwind process.

43. A process as defined in claim 31, wherein the absorbent articles that are being produced include a cover material, a liner material, and an absorbent material sandwiched in between the cover material and the liner material.

44. A process as defined in claim 43, wherein the material being unwound by the unwind device comprises the liner material, the cover material, or the absorbent material.

45. A process for forming an absorbent article comprising:  
unwinding a roll of a first material at a determined rate for processing using an unwind device, the unwind device being in communication with a festoon, the festoon including a plurality of rotatable guide rolls through which the first material being unwound is threaded, the festoon accumulating a determined length of the first material sufficient to sustain temporary stoppages by the unwind device during the unwind process;

decreasing the rate at which the roll of the first material is unwound causing the accumulated length of material contained in the festoon to be released in order for the rate at which the first material is moving downstream of the festoon to remain substantially unchanged;

actively decelerating certain of the guide rolls in the festoon when the rate at which the roll of the first material is unwound decreases at the unwind device, the guide rolls being decelerated independent of each other; and

wherein the first material being unwound is fed into a process for forming absorbent articles, the first material being incorporated into the absorbent article, the absorbent article comprising a liner material, an outer cover material, and an absorbent material positioned in between the liner material and the outer cover material.

46. A process as defined in claim 45, further comprising the steps of: increasing the rate at which the roll of the first material is unwound at the unwind device after the rate has been decreased; and

actively accelerating certain of the guide rolls in the festoon when the rate at which the roll of material is unwound increases, the guide rolls being accelerated independent of each other, the guide rolls being accelerated at a rate that generally corresponds to the rate at which the first material is accelerated through the festoon.

47. A process as defined in claim 45, wherein the festoon includes from about four (4) to about (10) guide rolls.

48. A process as defined in claim 45, wherein the guide rolls that are actively decelerated are decelerated according to a predetermined deceleration profile.

49. A process as defined in claim 48, wherein the speed of the guide rolls being actively decelerated is monitored and sent to a controller, the controller being configured to decelerate the guide rolls according to the deceleration profile based upon the monitored speed of each guide roll.

50. A process as defined in claim 45, wherein the guide rolls are actively decelerated by a braking device.

51. A process as defined in claim 45, wherein the guide rolls are actively decelerated by a stepper motor or a servo motor.

52. A process as defined in claim 45, wherein the festoon includes an upstream guide roll, a plurality of midstream guide rolls, and a downstream guide roll, and wherein the upstream guide roll and the midstream guide rolls are actively decelerated.

53. A process as defined in claim 45, wherein the rate at which the roll of material is unwound is decreased and temporarily stopped.



54. A process as defined in claim 45, wherein the first material being unwound from the roll is spliced to a second roll of material during the decrease in rate at which the roll of material is unwound.

5 55. A process as defined in claim 45, wherein the festoon includes a first set of guide rolls spaced from a second set of guide rolls, the first set of guide rolls being in operative association with a carriage, the carriage being movable towards the second set of guide rolls when the rate of material exiting the festoon is greater than the rate of material entering the festoon.

10 56. A process as defined in claim 45, wherein the roll of material is unwound at a rate of at least 100 feet per minute.

57. A process as defined in claim 45, wherein the festoon accumulates a length of material sufficient to sustain a stoppage of from about one (1) second to about five (5) seconds during the unwind process.

15 58. A process as defined in claim 45, wherein the absorbent article is one of diapers, child's training pants, feminine care articles, and incontinence articles.

59. A process as defined in claim 45, wherein the first material comprises the liner material, the cover material, or the absorbent material.